FIG.1

INPUT COMPRESSED IMAGE DATA

101 CODE BUFFER

102 DATA-COMPRESSING/ANALYZING SECTION

103 VARIABLE-LENGTH DECODING SECTION

104 INVERSE QUANTIZATION SECTION

105 COMPRESSION INVERSE DISCRETE-COSINE TRANSFORM SECTION (4×4)

106 COMPRESSION INVERSE DISCRETE-COSINE TRANSFORM SECTION (FIELD SEPARATION)

107 ⊕

108 MOTION-COMPENSATING SECTION (FIELD PREDICTION)

109 MOTION-COMPENSATING SECTION (FRAME PREDICTION)

110 VIDEO MEMORY

111 FRAME-CONVERTING/PHASE SHIFT CORRECTION SECTION

OUTPUT DECODED IMAGE DATA

```
0   1   5   6  14 15 27 28
2   4   7  13  16 26 29 42
3   8  12  17  25 30 41 43
9  11  18  24  31 40 44 53
10 19 23 32  39 45 52 54
20 22 33 38  46 51 55 60
21 34 37 47  50 56 59 61
35 36 48 49  57 58 62 63
```

FIG.2A

```
0   1   5   6  14 15 27 28
2   4   7  13  16 26 29 42
3   8  12  17  25 30 41 43
9  11  18  24  31 40 44 53
10 19 23 32  39 45 52 54
20 22 33 38  46 51 55 60
21 34 37 47  50 56 59 61
35 36 48 49  57 58 62 63
```

FIG.2B

```
0   4   6  20 | 22 36 38 52
1   5   7  21 | 23 37 39 53
2   8  19  24 | 34 40 50 54
3   9  18  25 | 35 41 51 55
10 17  26  30   42 46 56 60
11 16  27  31   43 47 57 61
12 15  28  32   44 48 58 62
13 14  29  33   45 49 59 63
```
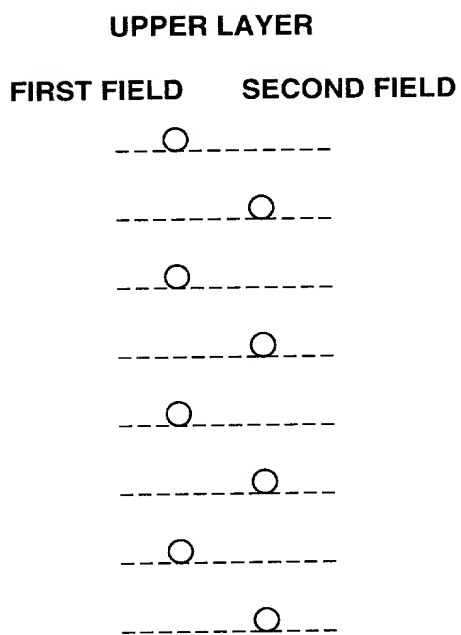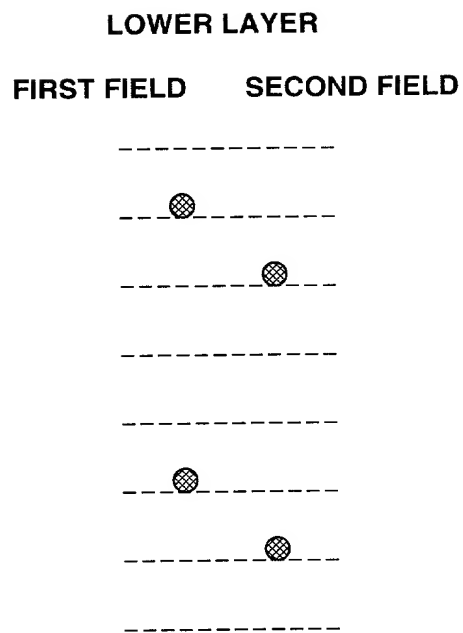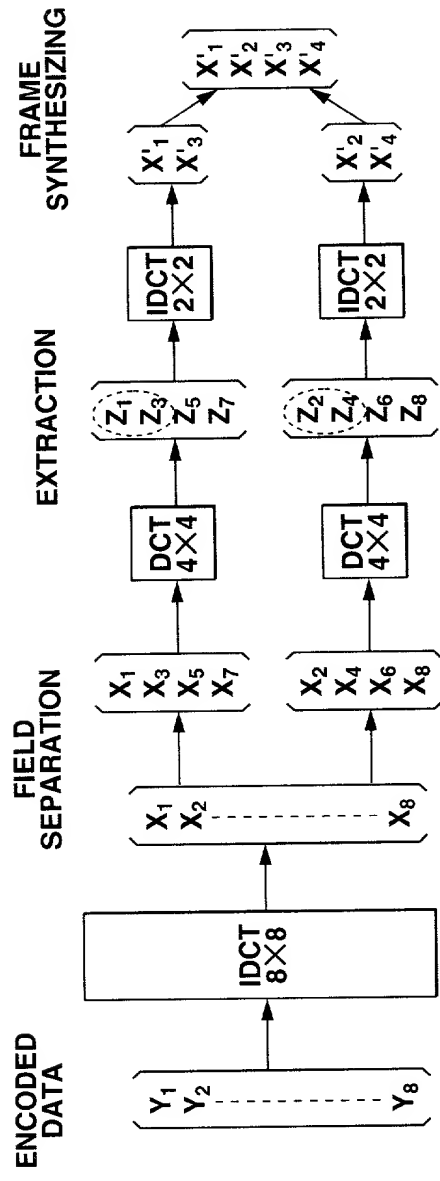
FIG.3A

```
0   4   6  20 | 22 36 38 52
1   5   7  21 | 23 37 39 53
2   8  19  24 | 34 40 50 54
3   9  18  25 | 35 41 51 55
10 17  26  30 | 42 46 56 60
11 16  27  31 | 43 47 57 61
12 15  28  32 | 44 48 58 62
13 14  29  33 | 45 49 59 63
```

FIG.3B

UPPER LAYER

FIRST FIELD   SECOND FIELD

LOWER LAYER

FIRST FIELD   SECOND FIELD

FIG.4A

FIG.4B

ENCODED
DATA

$\left\{\begin{array}{c} Y_1 \\ Y_2 \\ \text{---------} \\ Y_8 \end{array}\right.$

$\longrightarrow$

IDCT
8×8

$\longrightarrow$

FIELD
SEPARATION

$\left\{\begin{array}{c} X_1 \\ X_2 \\ \text{---------} \\ X_8 \end{array}\right.$

$\longrightarrow$

$\left\{\begin{array}{c} X_1 \\ X_3 \\ X_5 \\ X_7 \end{array}\right.$

$\left\{\begin{array}{c} X_2 \\ X_4 \\ X_6 \\ X_8 \end{array}\right.$

EXTRACTION

DCT
4×4

DCT
4×4

$\left\{\begin{array}{c} Z_1 \\ Z_3 \\ Z_5 \\ Z_7 \end{array}\right.$

$\left\{\begin{array}{c} Z_2 \\ Z_4 \\ Z_6 \\ Z_8 \end{array}\right.$

IDCT
2×2

IDCT
2×2

FRAME
SYNTHESIZING

$\left\{\begin{array}{c} X'_1 \\ X'_3 \end{array}\right.$

$\left\{\begin{array}{c} X'_2 \\ X'_4 \end{array}\right.$

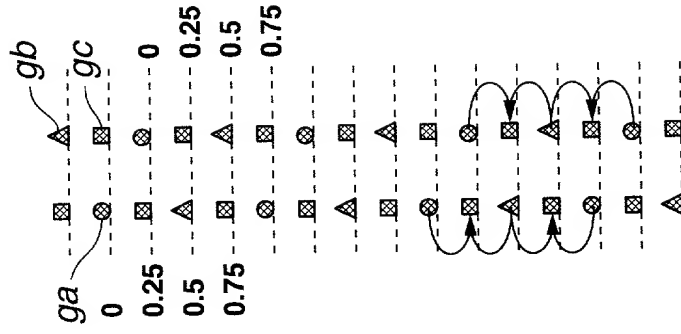$\left\{\begin{array}{c} X'_1 \\ X'_2 \\ X'_3 \\ X'_4 \end{array}\right.$

FIG.5
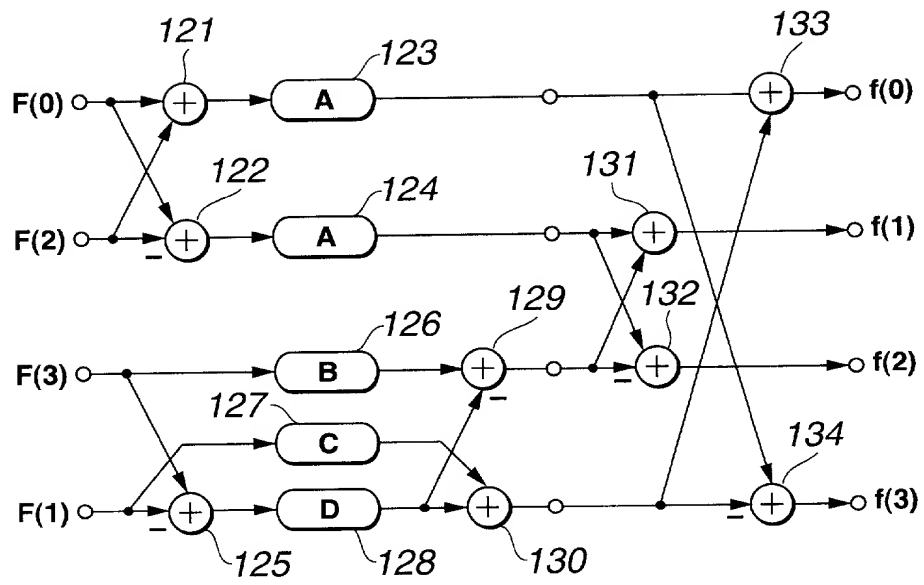
FIG.6
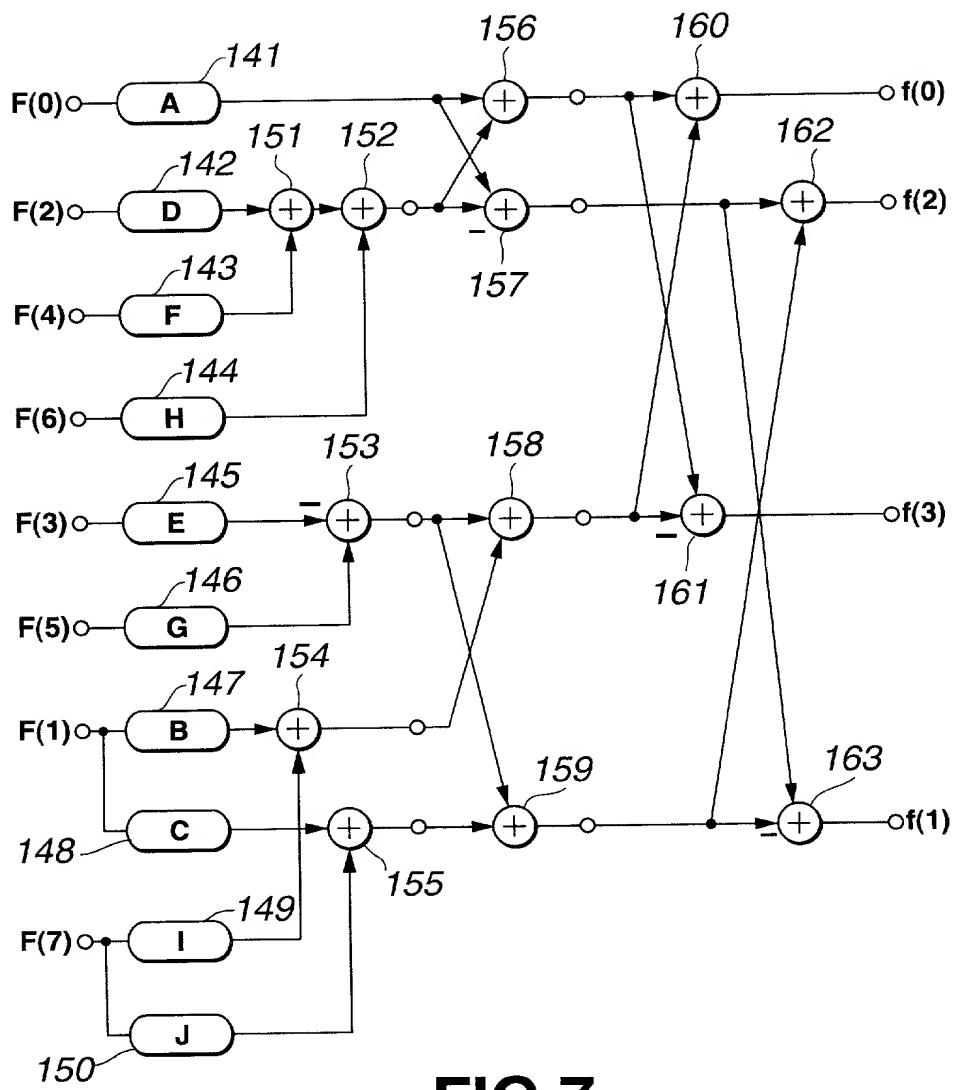
FIG.7
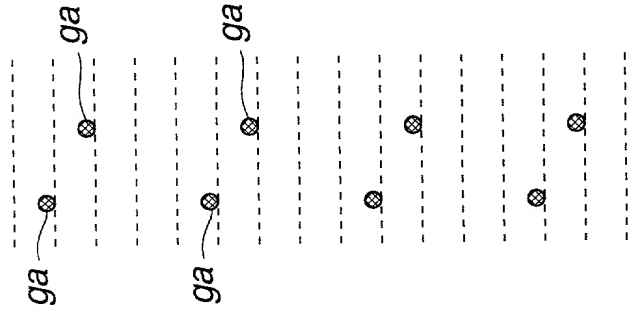
FIG.8A
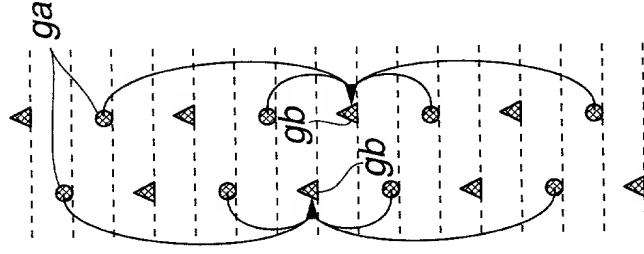
FIG.8B

FIG.8C

FIG.9A

FIG.9B

FIG.9C

ga

ga

gb

ga

gb

ga

gb

gb

gb

gb

gc

ga

0   0.25   0.5
       1.0   0.75
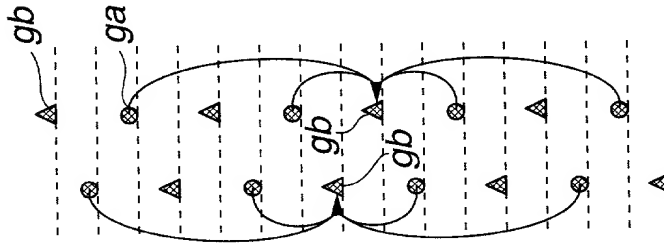1.25   1.5
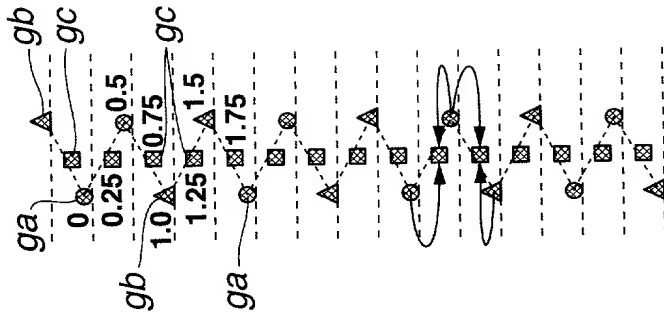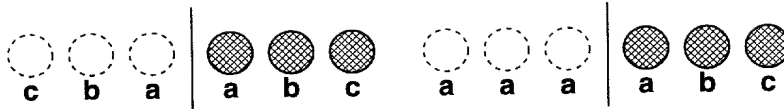1.75

gb

ga

gc
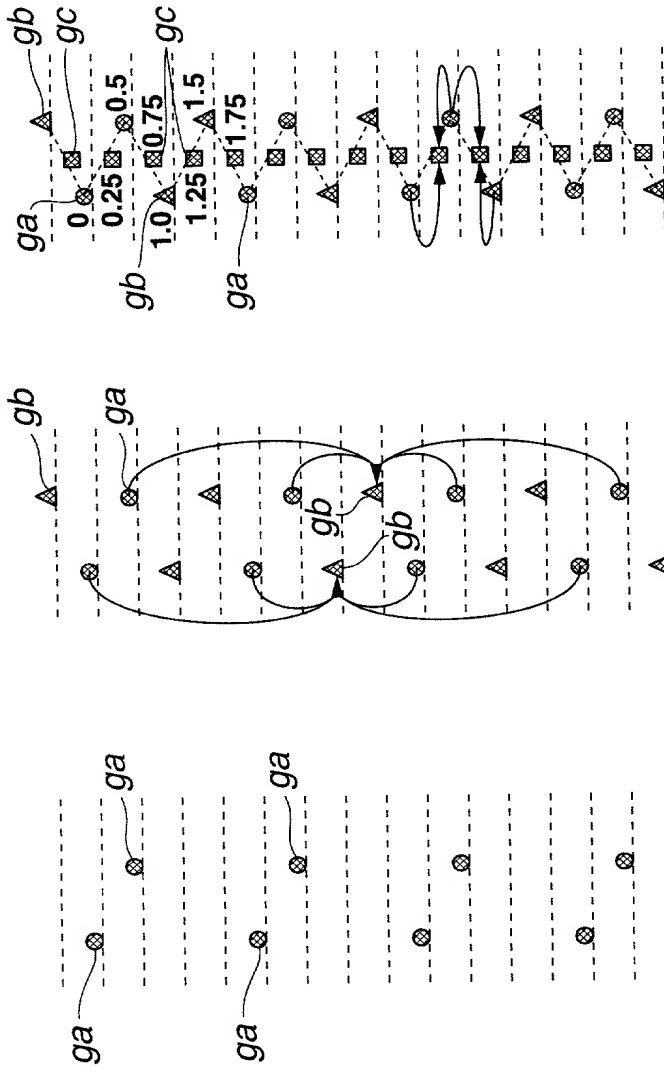
c b a | a b c   a a a | a b c

FIG.10A   FIG.10B

a ⊕ PIXEL DATA ITEMS STORED IN VIDEO MEMORY

b ○ VIRTUAL PIXELS OUTSIDE FRAME, WHICH
     ARE REQUIRED FOR INTERPOLATION
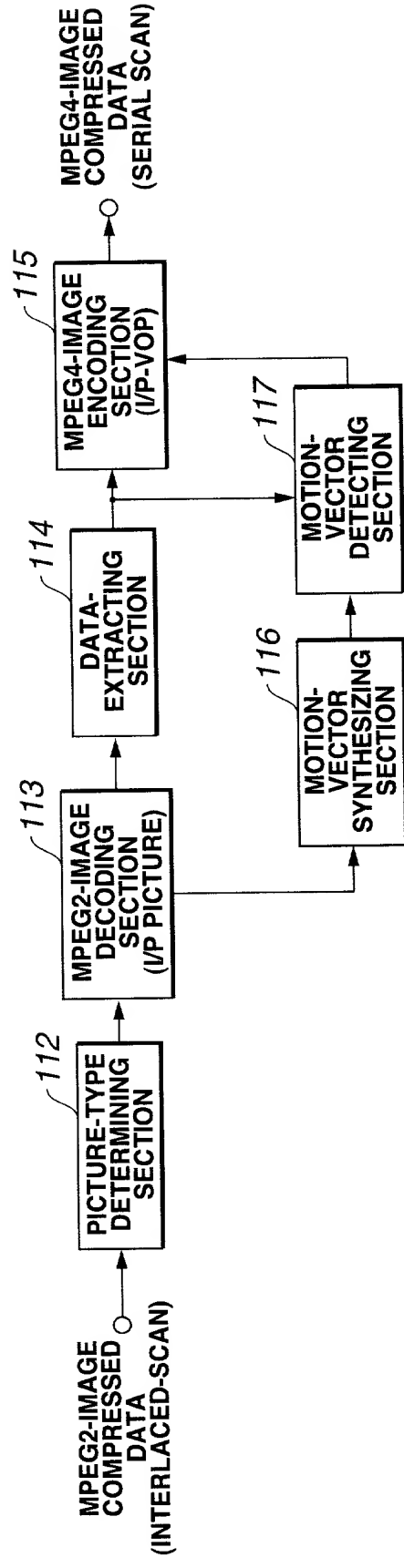
MPEG2-IMAGE COMPRESSED DATA (INTERLACED-SCAN) → *112* PICTURE-TYPE DETERMINING SECTION → *113* MPEG2-IMAGE DECODING SECTION (I/P PICTURE) → *114* DATA-EXTRACTING SECTION → *115* MPEG4-IMAGE ENCODING SECTION (I/P-VOP) → MPEG4-IMAGE COMPRESSED DATA (SERIAL SCAN)

116 MOTION-VECTOR SYNTHESIZING SECTION

117 MOTION-VECTOR DETECTING SECTION

FIG.11

MPEG2-IMAGE
COMPRESSED
DATA
(INTERLACED-SCAN) ○ →

18
PICTURE-TYPE
DETERMINING
SECTION

19
MPEG2-IMAGE
DECODING
SECTION
(I/P PICTURE
4×8DOWN-
DECODER)

20
SCAN-
CONVERTING
SECTION

21
MPEG4-IMAGE
ENCODING
SECTION
(I/P-VOP)
→ ○ MPEG4-IMAGE
COMPRESSED
DATA
(SERIAL SCAN)

22
MOTION-
VECTOR
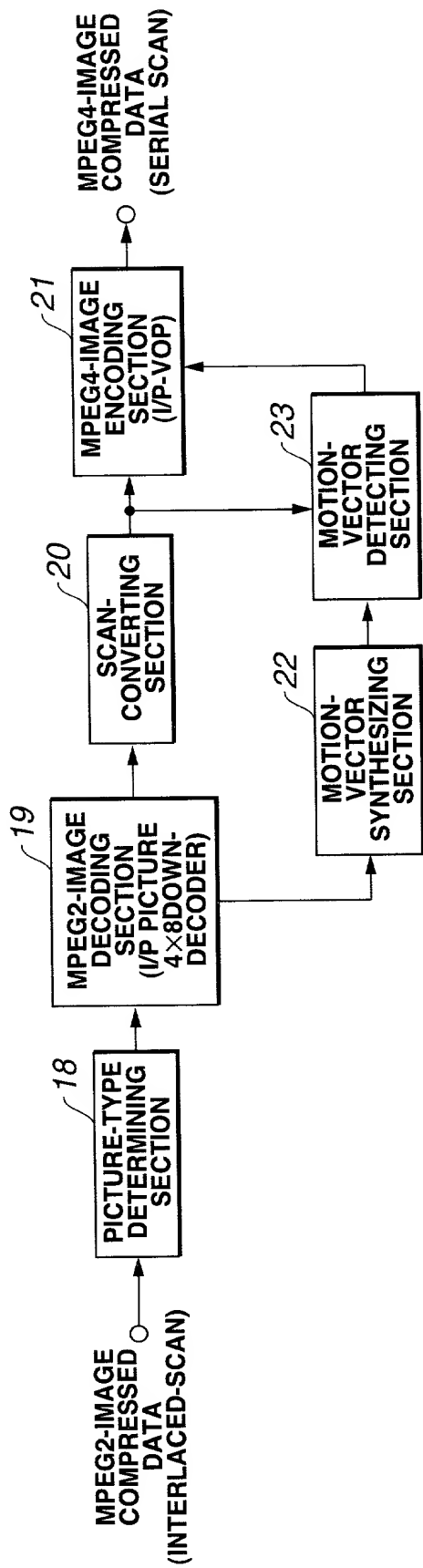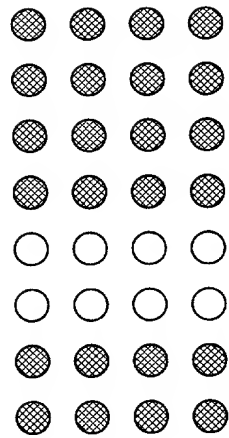SYNTHESIZING
SECTION

23
MOTION-
VECTOR
DETECTING
SECTION

FIG.12

⊛ PIXEL VALUES STORED IN VIDEO MEMORY
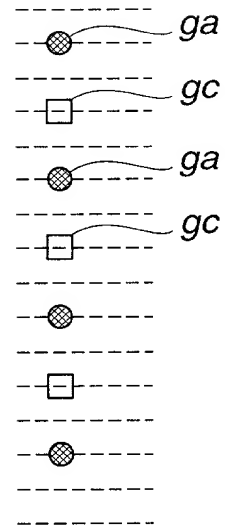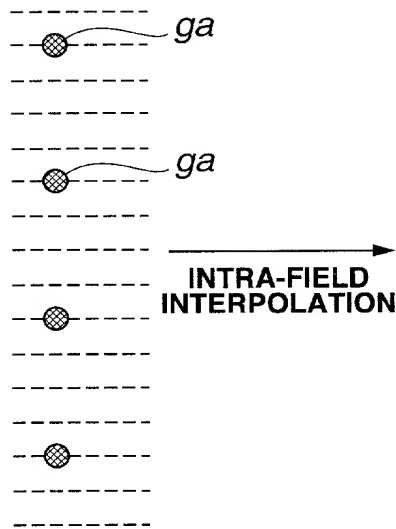◯ PIXEL VALUES TO BE REPLACED BY 0s

FIG.13

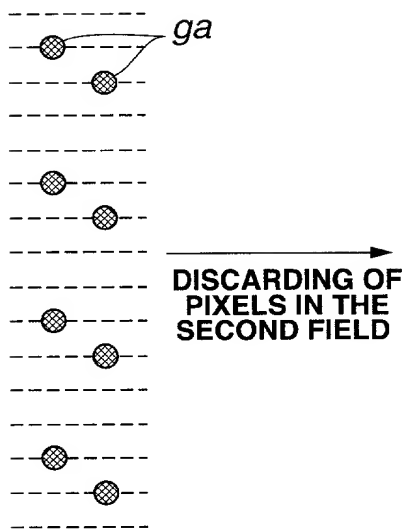DISCARDING OF
PIXELS IN THE
SECOND FIELD

INTRA-FIELD
INTERPOLATION

FIG.14A   **FIG.14B**   **FIG.14C**